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ABSTRACT

A study was designed to describe the nonverbal behaviors of two male/female couples as they initiated, maintained, and terminated their relationships. Over a five-month period, couple one met seven times and couple two met six times in a laboratory setting. During the meetings, observers coded the couples' nonverbal behaviors as eye gaze, smiles, head nods, touch, hand illustrations, and hand adaptors. Both frequency and duration measures were obtained for each of these categories, providing 12 categories for analysis. Techniques of data analysis included the use of summary statistics, "smoothing," jackknife variance estimates, correlations, lag correlations, correlagrams, and factor analysis. Findings showed that a clear difference existed in activity levels of the nonverbal behaviors across time, with people generally behaving differently at the initial and final parts of the relationship than they did in the middle part. (FL)

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Nonverbal Behaviors in Developing Relationships:

An Empirically-Based Descriptive Analysis*

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Paper presented at the meeting of the Central States Speech Association, St. Louis, Missouri, April, 1979.

* This report is based on one of a series of studies investigating communication in relationships, directed by Professor Mark L. Knapp. We thank Professor Knapp for his constant guidance and encouragement, Professor Robert Norton for expanding considerably our methodological horizons and Professor David Berg for financial assistance in securing the recording tapes.

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Nonverbal Behaviors in Developing Relationships:

An Empirically-Based Descriptive Analysis

To live in today's world is by definition to be involved in numerous interpersonal relationships. From birth to death one is a partner in parent-child, teacher-student, employer-employee, lover-mate and friend-friend pairs as well as "acquaintanceships" of lesser import. Many of an individual's days are spent in beginning, continuing or terminating relationships. That society places a high value on relationships is evident in a perusal of popular book, magazine and song themes; witness, for example, such titles as Looking for Mister Goodbar (Rossner, 1976), "A Whole New Way to be in Love" (Gross and Lovel, 1977), "50 Ways to Leave Your Lover" (Sigmon, 1975). Nor is the concern for relationships likely to lessen, for as Toffler (1970) points out, rapid technological change and increasing mobility will necessitate more relationships of shorter duration. Moreover, changing sex roles, alternative life styles and a rising divorce rate may be both symptoms and causes of relationships ever-changing in quality and quantity.

For the student of interpersonal communication, the study of relationships is essential. Whether one views communication as the "building blocks" of relationships or the contexts in which communication takes place, the inseparability of the two should be obvious. Indeed, Watzlawick, Beavin and Jackson (1967) contend that every message has information on both the content and the relationship level. Yet despite the importance of relationships to the study of communication, there are serious gaps in our knowledge of the connection between relationships and communication.

Rather than take the approach used by many of those following the current "godword" (relational) of the discipline of communication (see Parks, 1977 for a review of relational communication), the authors chose to take a descriptive approach. A review of the literature relevant to communication in relationship development (see Ashley and Elsea, 1977 for such a review) reveals that researchers have taken segments of relationships for study. Morton, Alexander and Altman (1976) write of the need for a longitudinal perspective while Hawes (1977) and Schiedel (1977) point to the need for descriptive data before building theory. Knapp (1978) drawing on the basic social penetration paradigm of Altman and Taylor (1973) suggests several stages for relationships "coming together" and "coming apart" and proposes general descriptions of communication at each stage. But as Bochner (1978) notes of the developmental approach to interpersonal communication, "no sufficiently explicit developmental model or theory has thus far been elaborated." (p. 190) Miller (1978) sums up the task for researchers:

> At a minimum, researchers must compare relationships at various temporal stages of development; at best they must trace the development of relationships over time to identify occurring patterns of change. (p. 170).

In a modest attempt to help "fill in the gaps" in our current knowledge, this paper will describe the nonverbal behaviors of two couples as they initiate, maintain and terminate their relationships. Two notes of caution are in order for the reader. First, the data set used here is concerned with nonverbal behaviors and self-reports. The verbal behaviors, taken from audio recordings of the couples' meetings, comprise the other part of the full data set. While ideally, verbal and nonverbal data should be analyzed together, at this stage of our knowledge, a

longitudinal look at nonverbal behaviors should prove instructive. Second, because of the small number of people and the obvious individual differences in communication behaviors, the description given here probably should not be generalized. Rather, the current report should serve as a beginning in providing a comparison for future efforts and as an example of what may be done in future research. While describing the nonverbal behaviors, the authors will use several techniques of data analysis. Some have proved to be more useful than others, but at this stage it is important to find what does not help as well as what does.

SUBJECTS

The researchers searched for volunteers from Communication classes and acquaintances that met three criteria: 1) that they be unmarried; 2) that they be over the age of 21; and, 3) that they be able to attend conversational sessions with their partners at least once a week for 2 months. It was felt that these criteria afforded the greatest opportunity for relational development. In addition, the researchers employed a totally subjective screening of volunteers, using only those who appeared to be "mature" and "emotionally stable." Twelve persons volunteered for the study. Six were used for the present study, the other six for a similar study which used self report diaries as the data-gathering instruments. Of the six subjects in the present study, three were undergraduates (two in Engineering, one in Fashion Retailing), and three were graduate students (one in Audiology and Speech Science, two in Communication). This sample represented an effort to capture a wide background of interests. It should be noted, however, that the sample represents "screened" volunteers

rather than a completely randomized selection procedure.

PROCEDURES

All twelve volunteers were asked to attend a meeting at which each person met at least two other potential partners. Each meeting lasted ten minutes. Immediately prior to the meeting the experimenters read the subjects the experimenter speech (see Appendix A). Immediately after each meeting the subjects completed semantic differential-type, 7-point scales on four dimensions: a) How willing are you to meet this person again? b) How satisfying was the meeting? c) How much information was exchanged? and d) How intimate is the relationship? Mixed-sex dyads for the duration of the study were then created based on these ratings and mutually agreeable schedules.

The following week the series of taped conversations began for each dyad. At each session subjects stayed in different rooms until their meetings began. They then entered the observation room at different times. When the second person entered the room, the observers began coding and continued until the subjects were halted at the end of thirty minutes. In this manner the coders recorded verbal and nonverbal behaviors from the first moment subjects saw one another until the last.

The first ten-minute meetings and the first two 30-minute meetings were videotaped in order that the coders could have a permanent record until sufficient inter-coder reliabilities could be obtained. After that time the inter-coder reliabilities (proportion of agreement) in each of the nonverbal categories ranged from .71 to 1.00. At that point nonverbal behaviors were coded by means of an Angus Esterline event recorder. In

addition, all sessions were audio tape recorded, thus providing a complete verbal transcription of all meetings.

Over a five-month period, couple 1 met for seven meetings, couple 2 for six meetings and couple 3 for five meetings. Because of technical difficulties, data for couple 3 and data for meeting 2 of couple 2 could not be analyzed. Therefore, the descriptions in this paper are based on the recorded nonverbal behaviors for couples 1 and 2.

OPERATIONAL DEFINITIONS

During the sessions the observers used the following categories by which to code nonverbal behaviors: eye gaze, smiles, head nods, touch, hand illustrators, and hand adaptors. For each of these six categories both frequency and duration measures were obtained, thus providing a total of 12 categories for analysis. These particular categories were used for two reasons: 1) they are researched extensively in nonverbal literature (see, for example, Knapp, Hart, and Dennis, 1974); hence, it is important to examine these behaviors as they change in a relationship over time; and 2) they appeared, at face value, as if they might indicate increasingly more intimate levels of interaction. For example, touch is an obvious indicant of a "more than superficial" relationship. And, the absence of hand adaptors might have indicated a comfortable relationship.

The following definitions are adapted from Knapp, Hart, and Dennis (1974):

1. Eye gaze frequency (EGF): the total number of times S's eyes moved from a "non-look" position to a "look" position. A "non-look" position involved S s viewing something other than the eye area of the other, while the "look" position was defined as the obverse.

2. Eye gaze duration (EGD): computed by noting the total amount of time Ss spent looking at the eye area of the other during the meeting

3. Adaptor frequency (ADF): the total number of times during which the hands were used to manipulate foreign objects, clothing, or parts of the body.

4. Adaptor duration (ADD): the total amount of time in which the hand was actually moving while being used to manipulate foreign objects, clothing, or parts of the body.

5. Illustrator frequency (ILLF): the total number of times the hands moved horizontally or vertically in a conscious or unconscious effort to "illustrate" what was being said.

6. Illustrator duration (ILLD): the total amount of time the hands actually moved horizontally or vertically while consciously or unconsciously attempting to help "illustrate" what was being said.

7. Smiling frequency (SMF): the total number of times that there were major changes in facial affect.

8. Smiling duration (SMD): the total amount of time each major change in facial affect lasted.

9. Head nod frequency (NODF): each clearly perceptible forward-backward motion of the head suggesting affirmation or encouragement.

10. Head nod duration (NODD): the total amount of time that it took for a subject to complete on clearly perceptible forward-backward cycle of the head, when suggesting affirmation or encouragement.

11. Touch frequency (TCHF): the total number of times that any part of one person's body came into physical contact with the other, whether purposefully or accidentally.

12. Touch duration (TCHD): the total amount of time from the moment one person came into physical contact with the other, until that contact was terminated.

Data Analyses

For the purpose of analysis, each meeting was divided into five-minute segments and total frequency and duration measures (in seconds) were tallied for each five-minute segment. Tallies were also made for the

end-segment for each meeting even if the segment did not last the full five minutes. Each occurrence of a behavior received a duration tally of at least one second; in others words, one second was the minimum unit of time recorded, even if the recorded behavior lasted only a fraction of a second. While this may tend to be a more gross measure, the authors' goal was the macroscopic view rather than the microscopic.

I. Condescriptive

In order to begin to look at the "big picture," the data were submitted to the SPSS Condescriptive program, which provides a number of summary statistics, some of which are reported in Table 1. Of particular interest are the mean, standard deviation, and minimum and maximum values for each variable. Inspection of Table 1 indicates that for the four paper-and-pencil variables, willingness to meet again (WILNG), information revealed in the meeting (INFO), satisfaction with the relationship (SAT) and intimacy of the relationship (INT), means of the first three fell well above the mid-point of the seven point scale. INT, on the other hand, had the lowest mean, the lowest minimum value, the greatest standard deviation and shared the largest range (4) with SAT. The summary statistics for these four measures suggest that, across all meetings for both couples, WILNG, INFO and SAT remained at fairly high levels while INT was somewhat lower and varied more than did the other three variables.

Table 1 also displays summaries of the twelve nonverbal behaviors. As the table shows, eye gaze was the most frequently occurring behavior, having a mean count of 27.521 times per time segment. The other variables, except touch, occurred between ten and twenty times per time segment while touch was recorded only four times during all the meetings together. Not

surprisingly, then, touch had the shortest mean for total duration per time segment. The extremely low frequency of touch is consistent with the couples' ratings of their relationships at near the mid-point of the INT scale. Mean total duration per segment was highest for eye gaze (147.5 seconds), while the remaining variables had mean total durations of from 12.438 seconds for illustrators to 25.692 seconds for smiles. Finally, Table 1 shows eye gaze to have the greatest standard deviation and the greatest minimum (3) and maximum (269) number of occurances, suggesting, as does previous research, the important influence of the eye gaze variable. All other variables failed to appear in at least one time segment.

Condescriptive provides a good first impression of the overall data set, but it fails to allow some important differences to be seen. It is apparent that individuals and dyads have very different communicative behaviors. To allow such differences to become apparent, the data were analyzed separately for each person by means of a second technique.

II. Smoothing

Tukey (1977) provides a way to "smooth" (take the rough edges off) a series of points to make it easier to see patterns in the data. Each variable for each person was smoothed to 3R (no further changes in the data through further smoothing). A second stage of smoothing called "splitting" was not undertaken because it tended to elongate peaks and valleys in the data. For each person, the smoothed points for each variable (except touch) were then plotted on the same axes with smoothed points for that person's partner. Couple 1 received the code names John and Mary, and couple 2 became Bob and Debbie. Thus 20 graphs were generated in all, one for each couple for each of 10 variables. Four of these

graphs are presented in Figures 1-4. After the smoothed data were plotted, boundaries for each meeting were drawn in on the graphs. Hence, each graph displays the total time line as well as the time line for each meeting for each behavior for each individual.

An examination of Figure 1 shows that John's eye gaze frequency, even after smoothing, varied considerably from one time segment to the next. Compared to Mary's eye gaze frequency, John's behavior was consistently more erratic, even for the final two meetings when the fluctuations were relatively smaller. The data in Figure 1 suggest two conclusions: 1) There are dramatic differences in individuals' styles of eye gazing behavior; and, 2) The middle portion of this relationship (meetings 3,4, and 5) was characterized by a smaller number of eye gazes than was the first portion (meetings 1 and 2) or the last portion (meetings 6 and 7). Such an overall pattern is consistent with the intuitive notion that people are more uncertain and nervous (and thus more active) at the beginning and end of a relationship. Figure 2 shows the same trend for Bob and Debbie; they exhibited more frequent eye gazing during the initial meetings (1 and 3) and the final meeting than during the middle meetings. Since there was approximately a 6-week time lapse between meetings 5 and 6 for John and Mary and the same length lapse between meetings 5 and 6 for Bob and Debbie, the increased activity for both couples at the ends of the relationships may have been spurred by a double uncertainty. First, they were, in a sense, becoming "reacquainted" since they had not met for some time. Second, they knew their meetings were to end soon and thus experienced the uncertainty of parting itself.

Figure 3 displaying the data for eye gaze duration, shows that John

characteristically (with only minor exceptions in meetings 5 and 6) gazed less at Mary than she gazed at him. Thus, the individual patterns illustrated in Figure 1 are repeated in Figure 3. John typically looked at Mary more times than she looked at him; typically her looks were longer than his. Another pattern from Figure 1 is continued in Figure 3: measures of eye gaze duration, like those of eye gaze frequency, tended to drop after the first two meetings and rise (at least for Mary) for the final two meetings.

Once again, the trends found for John and Mary appear to hold for Bob and Debbie. First, Debbie's eye gaze duration measures (see fig. 4) were typically longer than Bill's. Unlike his male counterpart in couple 1, however, Bill did not typically gaze more frequently at his partner. Second, eye gaze duration totals, like those for eye gaze frequency, tended to be smaller for the middle meetings.

The data for smiles (graphs for variables other than eye gaze are not reported due to space limitations) indicate that the males smiled less frequently and for a shorter duration than did the females. Greater activity at each end of the meetings, which was apparent in the eye gaze behaviors, did not carry over to smile behaviors. One pattern apparent for each couple was that when one person smiled the partner tended to smile, as indicated by graphs which are roughly parallel for both frequency and duration for each couple.

Unlike smiles, illustrators, both in frequency and duration, tended to increase for one member as they decreased for the partner. Such a trend is to be expected unless both partners often talked simultaneously. The data suggest, instead, that illustrators followed some kind of turn

taking. In addition, individual and sex differences once again appeared. John was most "dramatic" in his use of illustrators, while Bob also showed great fluctuations in both frequency and duration. The females, by contrast, tended to use illustrators less frequently and less extensively than the males.

Until the last two meetings, both couples' adaptor frequencies followed, like their smiles, a pattern of symmetry as one member used more adaptors, so did the partner. This symmetry held for John and Mary until meeting 5 and for Bob and Debbie until about half-way through meeting 5, until the graphs assumed more of a complementary relationship: as one rose, the other fell. Two competing explanations may explain the adaptor behavior of the couples. First, since adaptors include "fidgeting" and other signs of nervousness, it may be that the couples were not comfortable enough with each other until about meeting 5 to depart from the same pattern of adaptors exhibited by the partner. Only then were they free of the infectuous effects of uncertainty. A second, and perhaps more likely, explanation, is that couples saw the end in sight and no longer felt the obligation to be "controlled" by the behaviors of the partner. In other words, the couples were coming apart and no longer felt compelled by the norms of the relationship.

Analysis of head nods reveals different patterns for the two couples. Graphs for John and Mary, for example, show nod behaviors that are symmetrical while Bob and Debbie's behaviors are more complementary. However, at the very beginning and end of each relationship, the patterns change for both couples. Once again, behaviors at the middle of the relationship have a different pattern than those at the extremes.

Touch behaviors were not recorded because they took place so infrequently. This lack of touching is consistent with the earlier ratings of INT. There may be a "ceiling effect" on the degree of intimacy that may develop, especially in the laboratory. This ceiling effect may even hold true for some of the other behaviors as well, implying that the patterns discovered therein may not generalize across settings.

In sum, smoothing proved to be a very useful technique for analyzing the data since it allowed patterns to emerge. Some data points were obscured in the smoothing process, but the goal of seeing general trends was achieved.

III. "Jackknife" Estimates of Error

One of the patterns suggested by the smoothed data was a difference in behaviors in the middle portion of the relationships. A technique to estimate the variance of a measure, called the jackknife by Mosteller and Tukey (1968), estimates error terms with less bias than the conventional standard deviation. A more precise error term was deemed necessary because of the nature of the data. The nonverbal behaviors were viewed as being influenced, especially in this quasi-maturalistic situation, by numerous uncontrolled variables. Consequently, an "adjusting" for this outside influence, as well as for measurement error was provided by the jackknife procedure. Since the jackknife is a precise estimate of variance it is also useful in providing a baseline against which the behaviors recorded in other studies may be compared. Then researchers may have some confidence in the size of variance estimator to be used in calculating, via the power formula, the number of observations necessary for hypothesis testing. Perhaps the strongest reason for using the jackknife estimate,

therefore, is because it aids researchers in using the precise observations made in descriptive research as a basis for later experimental studies.

In calculating jackknife estimates, measures taken from time segments of less than 285 seconds were not included. Table 2 presents the jackknife estimates for each behavior for each person for each meeting. While the patterns in Table 2 are not as readily apparent as those in the smoothed data, some trends can nevertheless be discerned. Generally, jackknives for EGF were smaller for the middle meetings. This pattern is consistent with the earlier speculation that there is more uncertainty at the beginning and end of a relationship. Jackknives for EGD, however, were larger in the middle portion for John and Mary but not for Bob and Debbie. This finding partially supports the uncertainty speculation.

Jackknives for SMF were slightly greater for the middle meetings, and there was no consistent pattern for the estimates for SMD. ILLF estimates were generally smaller for the middle meetings while no pattern emerged from the estimates of ILLD. NODF estimates also were larger for the middle meetings, but NODD jackknives showed no consistent pattern.

Taken together, the jackknife estimates illustrate that there was generally a difference in the variation of nonverbal behaviors in the middle as opposed to the beginning and final meetings. Perhaps the one second minimum unit used for the duration measures limited their variation. It is not clear why EGF and ILIF should show less variation during the middle meetings while SMF, NOD and ADF show more variation for the same time span, but it is easy to see that these measures "behave" differently.

IV. Correlations of Partners' Behaviors

The smoothed data suggested that some behaviors were complementary while others were symmetrical for the couples. Because the summetry-complementary

(see Watzlawick, Beavin and Jackson, 1967) conceptualization seemed to promise a useful characterization of behaviors, some measure more precise than visual inspection was needed. Correlations were judged such a measure, for the greater the degree to which partners' behaviors were symmetrical, the greater would be a positive correlation between those behaviors. Conversely, the degree of complementarity would be expressed by a negative correlation, with higher negative correlations indicating behaviors high in complementarity. Finally, behaviors with very low correlations would fall near the midpoint on the symmetry-complementarity continuum.

Table 3 contains correlations of partners' behaviors for each couple for each variable studied. Scrutiny of the table yields the conclusion that the two couples had very different relationships in terms of symmetry and complementarity. John and Mary, for example, over the duration of the relationship, had negative correlations on only two behaviors, ILLF and ILLD. As mentioned previously, complementarity for illustrators is to be expected unless both partners habitually talk simultaneously, an unlikely situation. For John and Mary all other correlations are positive, so their relationship could be characterized as symmetrical. Symmetry suggests that John and Mary exhibited reciprocity in their nonverbal behaviors; each partner tended to behave as did the other within the same time segment.

Bob and Debbie, on the other hand, received positive correlations for only three variables, SMF, ADF, and ADD. Their relationship could be characterized as complementary; as one partner exhibited more of a behavior, the other partner exhibited less of that behavior. Of particular interest is the -.86 correlation for EGD, and indication that the longer one member of the couple looked at the other, the shorter were the other's looks in

return. Such behavior may be an indication of lack of comfort for at least one party, a conjecture that was confirmed by Bob in his exit interview after the study was completed.

V. Lag Correlations

Since individual and couple differences were revealed in the foregoing analyses, general trends across all members for all meetings were sought next. A lag correlation, using the Pearson correlation program of SPSS, was computed for each variable to see how it correlated with itself over time. Each correlation was based on 146 cases, the number of time segments for both couples considered together. The lag correlations are thus a measure of association between a behavior at one time and the same behavior at a subsequent time, taking into account both couples' behaviors throughout their meetings.

Table 4 contains the lag correlations for each variable. Except for touch, which occurred too infrequently to be of use in this analysis, all the variables had lag correlations which were positive and significant at very high levels. More important than significance levels, however, were the levels of the correlations themselves, which ranged from .2183 for EGF to .5991 for EGD. The lag correlations may have been even higher had all time segments been a full five minutes. Taken together, the lag correlations suggest that generally, a nonverbal behavior in one time segment is associated with that same behavior in the immediately preceding time segment.

VI. Correlagram

A correlation matrix was generated by the SPSS program Pearson correlation. The variables correlated included all those previously

mentioned as well as SEX, number of laboratory meetings (LABMT), number of meetings outside the laboratory (OUTMT) and TIME (measured in seconds of time actually met in the laboratory). Based on a decision rule of $r \geq .40$ the resulting correlagram is Figure 5. As the figure shows, two large clusters and two smaller ones are apparent. Had the decision rule been set at $r \geq .35$, there would have been a linking of the two large clusters by INT (which has correlations of -.3455 with WILNG, -.3941 with SAT, .3884 with EGD, and .3964 with SMF). These linkages are indicated by dotted lines on the correlagram.

Unfortunately, only EGS and SMF moderately correlate with WILNG, SAT, INFO, OUTMT, LARMT or TIME. This is unfortunate because the development paradigm would suggest some dintinct associations of certain behaviors with the development of a relationship. This finding of few moderately strong correlations is not surprising, however, since the behaviors were recorded by observers and the other variables were measured by time or by paper and pencil self-reports of the participants.

Fortunately, some conclusions can be drawn about the couples from the correlagram. First, INT is correlated with EGD and SMF, as would be expected since smiling is a "friendly" behavior and eye gaze is a dominant variable for both couples. Second, INFO, WILNG and SAT are all positively and moderately strongly correlated, but INT is negatively associated with WILNG and SAT. This is consistent with an earlier discovery in the condescriptive analysis that INFO, SAT and WILNG had higher means and less variation than did INT. Third, WILNG has negative correlations with OUTMT, LABMT and TIME. Apparently, as time passed the couples became less willing to meet again.

The high correlations between ADF and ADD, NODF and NODD and ILLF and ILLD may be an artifact of the one second minimum unit of measurement. Finally, the correlagram suggests at least two and perhaps several clusters or factors.

VII. Factor Analysis

The SPSS factor program with varimax rotation was used to analyze the data, and the emergent structure was very similar to that produced by the correlagram. The N factor solution produced seven factors. Table 5 shows the % of variance explained by each of the seven factors and those variables which loaded at least .5 on one factor with no loadings higher than .3 on another factor. Since this is an exploratory descriptive study, the table also contains loadings which do not strictly adhere to the .5/.3 rule but which may be important in understanding the factor structure.

Figure 6 is composed of the configuration from the correlagram with the factors from the factor analysis drawn in. One important conclusion from the factor analysis is that INT, as predicted by the correlagram, loads on two clusters. Similarly, the eye gaze variables load on two factors, being associated with smiles, illustrators and adaptors. Factor 1 includes the paper and pencil participant perception variables while factor 6 seems to be a time variable. With the exception of eye gazes, other nonverbal behaviors tend to form factors of their own, indicating a relative separateness.

CONCLUSION

Other analyses will yield more information about the data set described here. Regression, in particular, may prove useful in delineating which behaviors "predict" a certain time in a relationship. Time would be an appropriate dependent variable because judgments are often made about how "far along" a relationship has progressed, based on the behaviors of the participants. It would probably be most useful to begin by using regression on individual relationships since one of the most obvious conclusions of this paper is that there are important differences in the behavior patterns of couples and of individuals.

One way of conceptualizing these differences is the complementarity-symmetry dimension suggested by Watlawick, Beavin and Jackson (1967). As this data indicate, couples differ in their positions on the continuum. For this very limited sample of two couples, symmetry was associated with greater mutual satisfaction of the partners. The smoothing technique indicated that some behaviors which may be complementary become symmetrical at the beginning and end of a relationship. Two questions, which need to be investigated, remain concerning the complementarity-symmetry issue: 1) Do individuals habitually seek relationships of one type? 2) Does the complementarity-symmetrity of the couple's relationship change as the relationship begins, develops and ends?

Perhaps the most encouraging finding of the present report was a clear difference in activity levels of the nonverbal behaviors across time. Generally, people behaved differently at the initial and final parts of the relationship than they did in the middle part. A final word of caution is in order. This data set was based on the nonverbal behaviors

from 12 meetings of 2 couples who met in a laboratory. Generalization of findings reported herein is, therefore, extremely risky. Nevertheless, this report can provide a place to begin for those who wish to describe the stages of relationships. The general patterns discovered and the jackknife estimates of error should prove particularly useful.

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APPENDIX A

The purpose of our study is this: We want to know how people go about the business of forming and creating relationships with other people. We'd like to watch how you form and maintain relationships and then compare it with other people's ways. Therefore, we'd like you to be as completely natural as possible. There's no right or wrong way of doing things -- we're just curious if your way is like other people's ways. So just be yourself and have fun. We're going to tape record your discussions with your partner this semester, and we're going to videotape the first two or three meetings. I know that might feel a little strange but it's the only way we have of getting everything down. It will just be a short time until you're used to it and forget it's there.

Here's pretty much what's going to happen. Today, you'll be meeting one or two other persons for ten (10) minutes. It's just a get acquainted period, but it will be taped. We'd mostly just like to get you used to the whole process. The study will be starting in earnest next week. That's when you'll be meeting the person that you'll be meeting with for the rest of these sessions. The persons you meet today may or may not be your permanent partner. When you meet the person we won't give you any direction whatsoever about what to talk about. The person you'll be meeting is in the dark just as much as you are, so the two of you will have to work out together your topics of conversation. Today you'll just meet for ten (10) minutes but the rest of the sessions are supposed to last at least thirty (30) minutes. When a meeting is over you're free to go, unless we ask you to fill out a questionnaire. Any questions?

O.K., Here's the Informed Consent Form.

Table 1. Summary for WILNG, INFO, SAT, INT, and Nonverbal Behaviors

Variable	Mean	Standard Deviation	Minimum Value	Maximum Value
WILNG	5.870	.881	4	7
INFO	5.568	.813	4	7
SAT	5.616	.896	4	7
INT	3.877	1.209	2	6
EGF	27.521	10.880	3	52
EGD	147.5	78.849	3	269
SMF	15.315	9.222	0	47
SMD	25.692	19.427	0	91
ILLF	19.144	1.357	0	86
ILLD	21.603	18.002	0	87
ADF	11.986	8.598	0	43
ADD	14.137	10.668	0	63
NODF	11.712	8.270	0	41
NODD	12.438	9.193	0	44
TCHF	.027	.202	0	2
TCHD	.027	.202	0	2

Table 2.

Jackknife Estimates of Error
for Each Behavior of Each Person
for Each Meeting

Meeting	John	Mary	Bob	Debbie
		EGF		
1	9.215	5.969	9.550	8.317
2	7.843	5.760		
3	7.453	3.891	4.721	5.673
4	6.083	9.914	7.747	9.665
5	4.449	5.681	12.458	5.921
6	5.297	5.819	10.034	
7	7.340	6.329		
		EGD		
	32.029	7.607	19.262	17.821
	26.892	31.266		
	83.226	84.976	23.899	20.121
	44.327	26.819	13.001	25.817
	53.304	43.765	80.606	20.268
	41.865	31.513	20.294	68.443
	29.695	59.510		
		SMF		
	6.234	5.302	5.678	4.992
	6.3315	6.558		
	6.854	3.622	2.066	9.508
	7.203	9.914	4.690	14.467

Table 2 (continued)

John	Mary	Bob	Debbie
5.655	5.870	2.280	3.286
6.149	5.789	3.795	2.739
8.305	6.329		
	SMD		
17.199	9.073	11.402	2.217
8.742	25.3035		
34.684	5.186	5.465	19.704
24.019	19.328	5.367	27.833
13.443	5.524	2.280	5.413
16.949	13.486	6.274	14.720
26.419	10.481		
	ILLF		
16.079	10.058	6.272	6.946
15.990	4.856		
12.017	7.541	14.832	13.871
12.093	7.450	15.582	2.550
9.787	14.091	20.736	11.327
9.947	4.096	15.433	6.356
30.754	9.439		
	ILLD		
12.371	18.613	6.272	6.946
14.713	5.262		
12.017	12.196	14.832	13.871
13.553	9.126	15.582	2.550
9.375	15.565	20.737	11.327
9.866	6.661	15.433	6.356
35.002	14.256		

Table 2 (continued)

John	Mary	Bob	Debbie
	ADF		
6.829	4.387	.957	1.732
3.341	3.494		
9.128	9.658	6.957	4.446
5.397	7.395	4.025	3.130
7.900	10.947	7.197	4.062
6.602	8.471	7.815	3.061
5.494	5.778		
	ADD		
7.053	5.250	.957	1.258
3.985	3.500		
9.572	9.552	9.496	5.367
6.644	7.302	4.025	2.775
6.006	12.788	7.733	6.693
31.590	12.618	8.796	3.724
15.374	10.040		
	NODE		
5.436	3.388	12.961	2.380
4.156	5.188		
7.892	4.655	6.653	6.153
4.706	9.149	2.550	4.561
7.890	6.475	5.565	2.510
5.828	.973	4.817	4.491
7.425	3.851		

Table 2 (continued)

John	Mary	NODD	Bob	Debbie
6.405	3.349		13.276	2.380
4.156	5.829			
7.892	4.655		8.704	2.380
4.673	9.683		2.550	5.967
7.890	6.475		5.357	4.561
5.828	1.646		4.817	4.665
7.425	4.392			

Table 3. Correlations of Partner's Nonverbal Behaviors for All Meetings

	Couple 1 (John and Mary)	Couple 2 (Bob and Debbie)
EGF	.14	-.08
EGD	.51	-.86
SMF	.35	.15
SMD	.40	-.08
ILLF	-.50	-.64
ILLD	-.38	-.60
ADF	.24	.05
ADD	.37	.06
NODF	.06	-.34
NODD	.07	-.26

Table 4. Lag Correlations
for Nonverbal Behaviors

Variable	Lag Correlation	Significance Level
EGF	.2183	.004
EGD	.5991	.001
SMF	.3882	.001
ILLF	.4568	.001
ILLD	.4264	.001
ADF	.4116	.001
ADD	.2271	.003
NODF	.4113	.001
NODD	.4202	.001
TCHF	-.0186	.412
TCHD	-.0186	.412

Table 5. Partial Results of Factor Analysis

Factor	Variable	Factor Loading	% of Variance Explained
1			25.7
	OUTMT	-.60	
	WILNG	.88	
	INFO	.62	
	SAT	.77	
	INT	-.50	
2			18.4
	INT	.44	
	EGD	.52	
	SMF	.95	
	SMD	.88	
3			17.3
	EGF	.48	
	ILLF	.95	
	ILLD	.97	
4			12.1
	EGF	.34	
	EGD	.32	
	ADF	.93	
	ADD	.93	
5			10.2
	NODF	.95	
	NODD	.96	

Table 5 (continued)

Factor	Variable	Factor Loading	%of Variance Explained
6			9.4
	LARMT	.97	
	OUTMT	.65	
	TIME	.94	
7			6.9
	TCHF	.99	
	TCHD	.99	

Figure 1

Eye Gaze Frequency (EGF) in Seconds

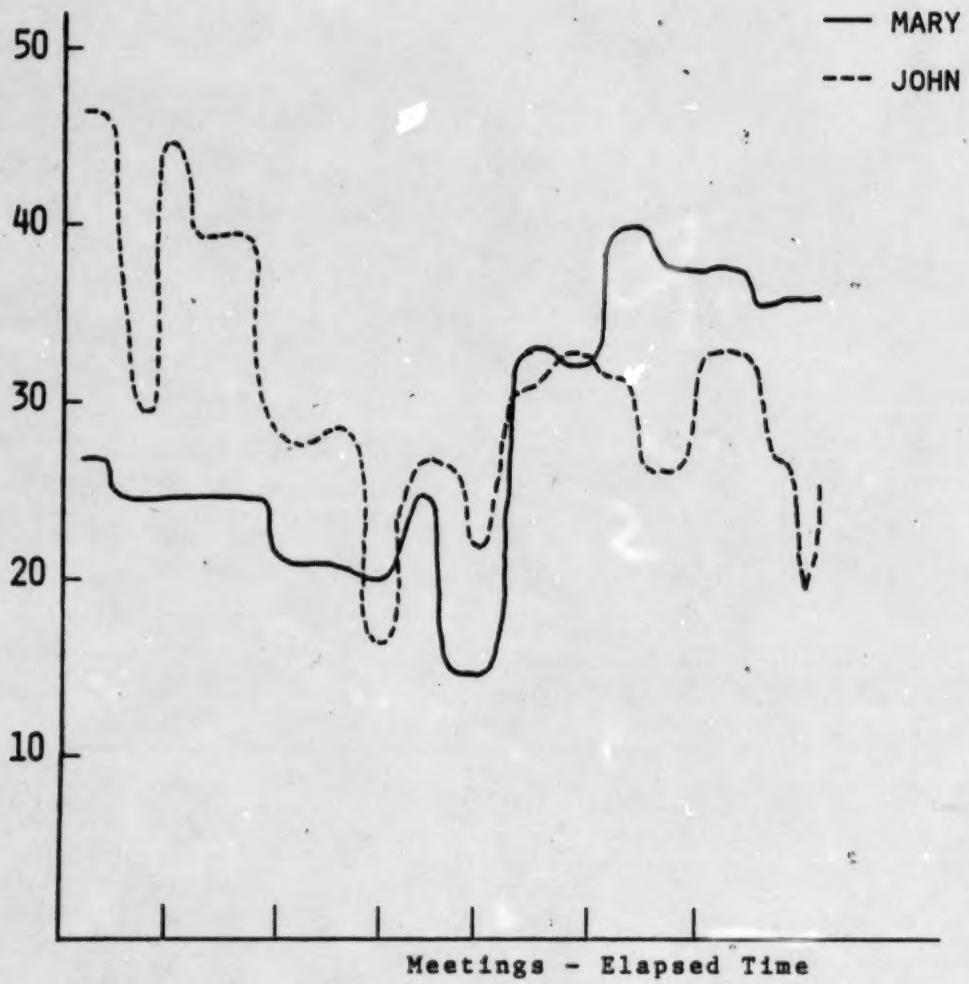


Figure 2

Eye Gaze Frequency (EGF) in Seconds

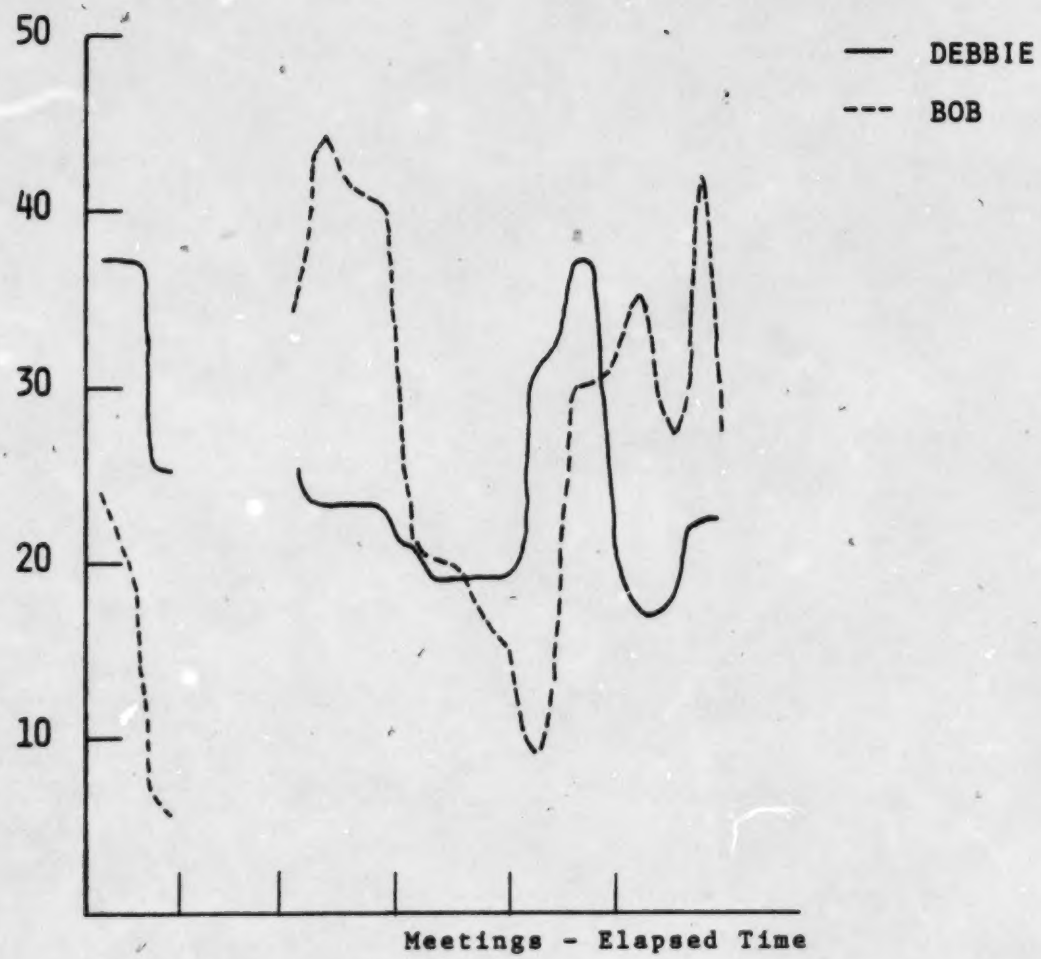


Figure 3

Eye Gaze Duration (EGD) in Seconds

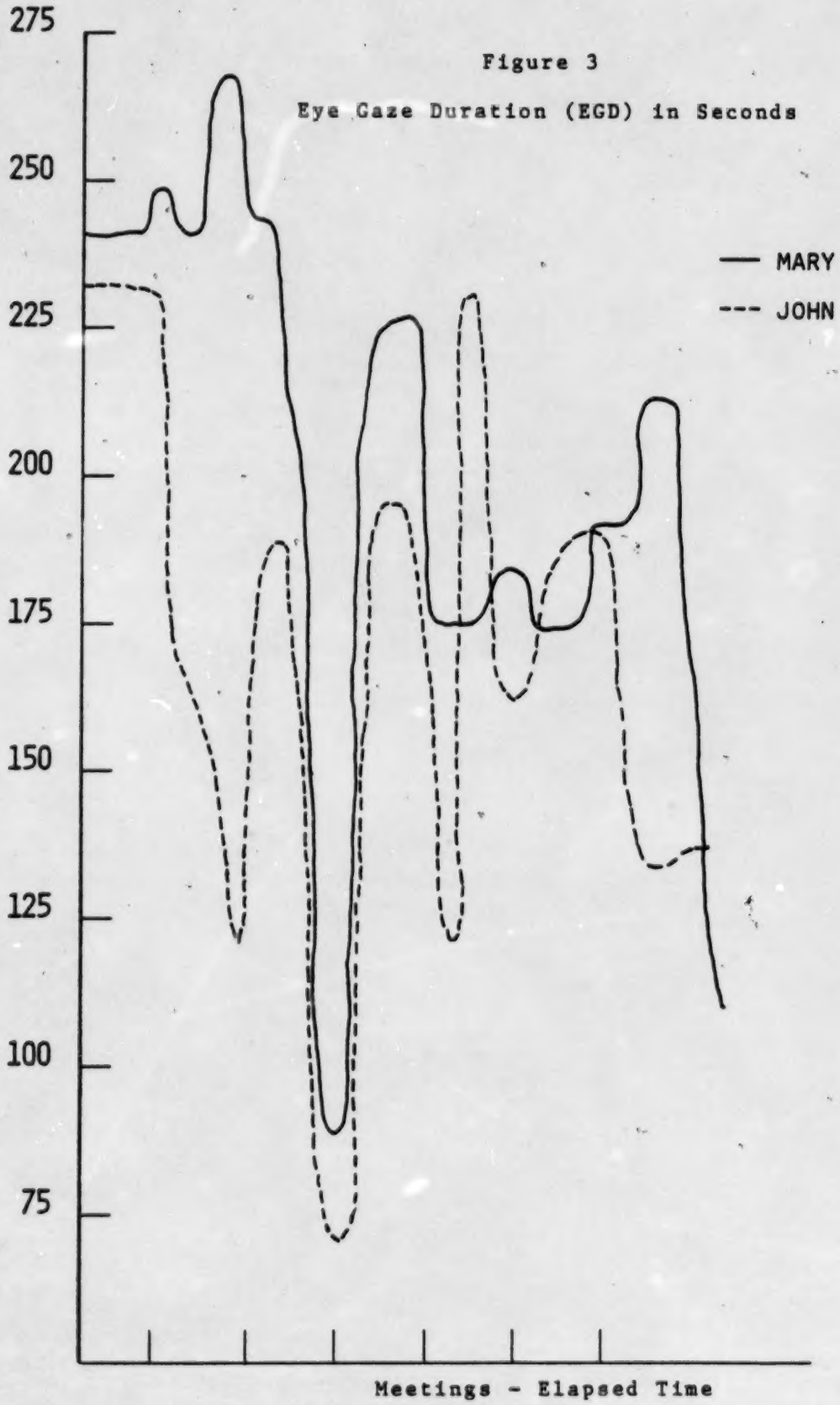


Figure 4

Eye Gaze Duration (EGD) in Seconds

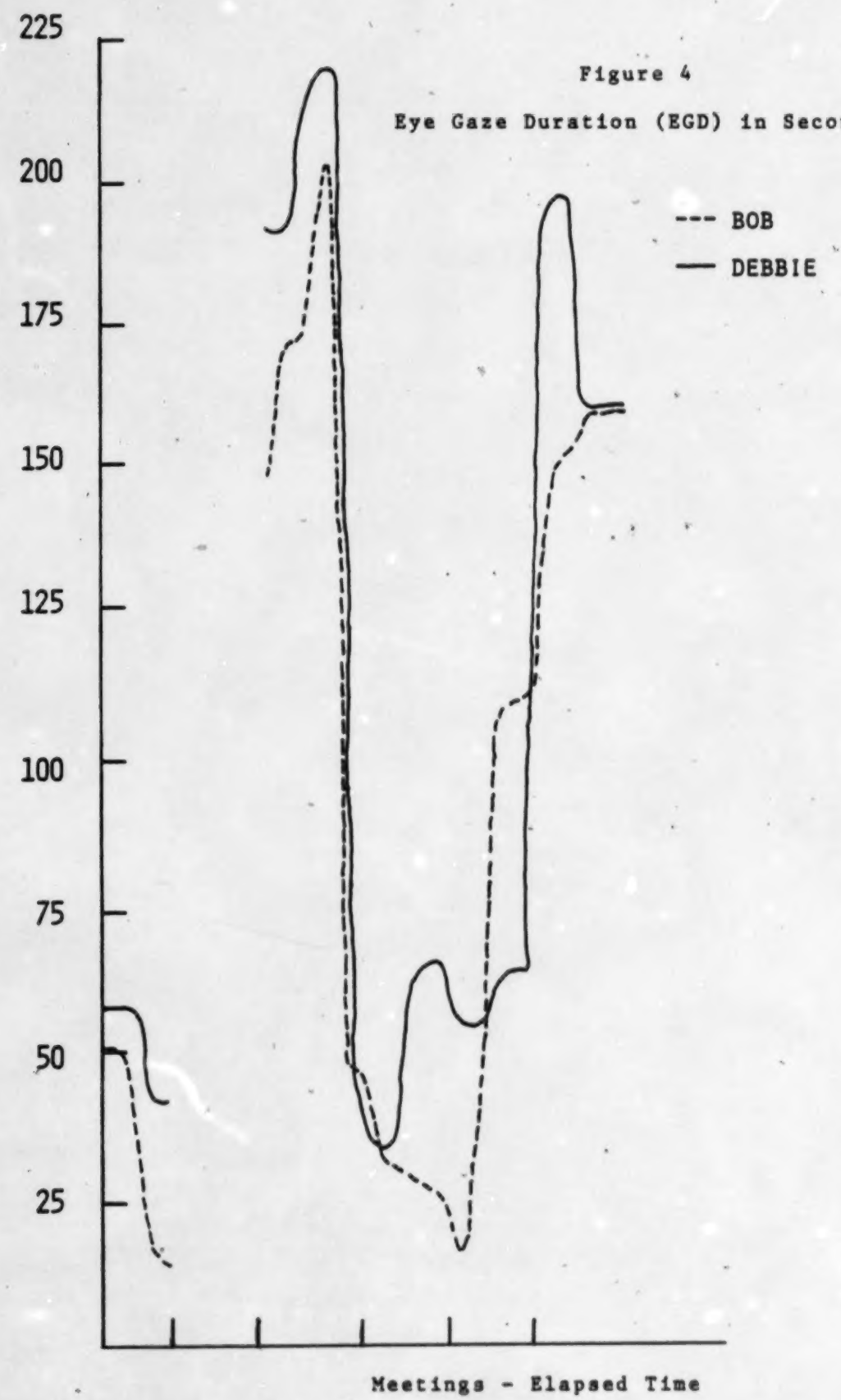
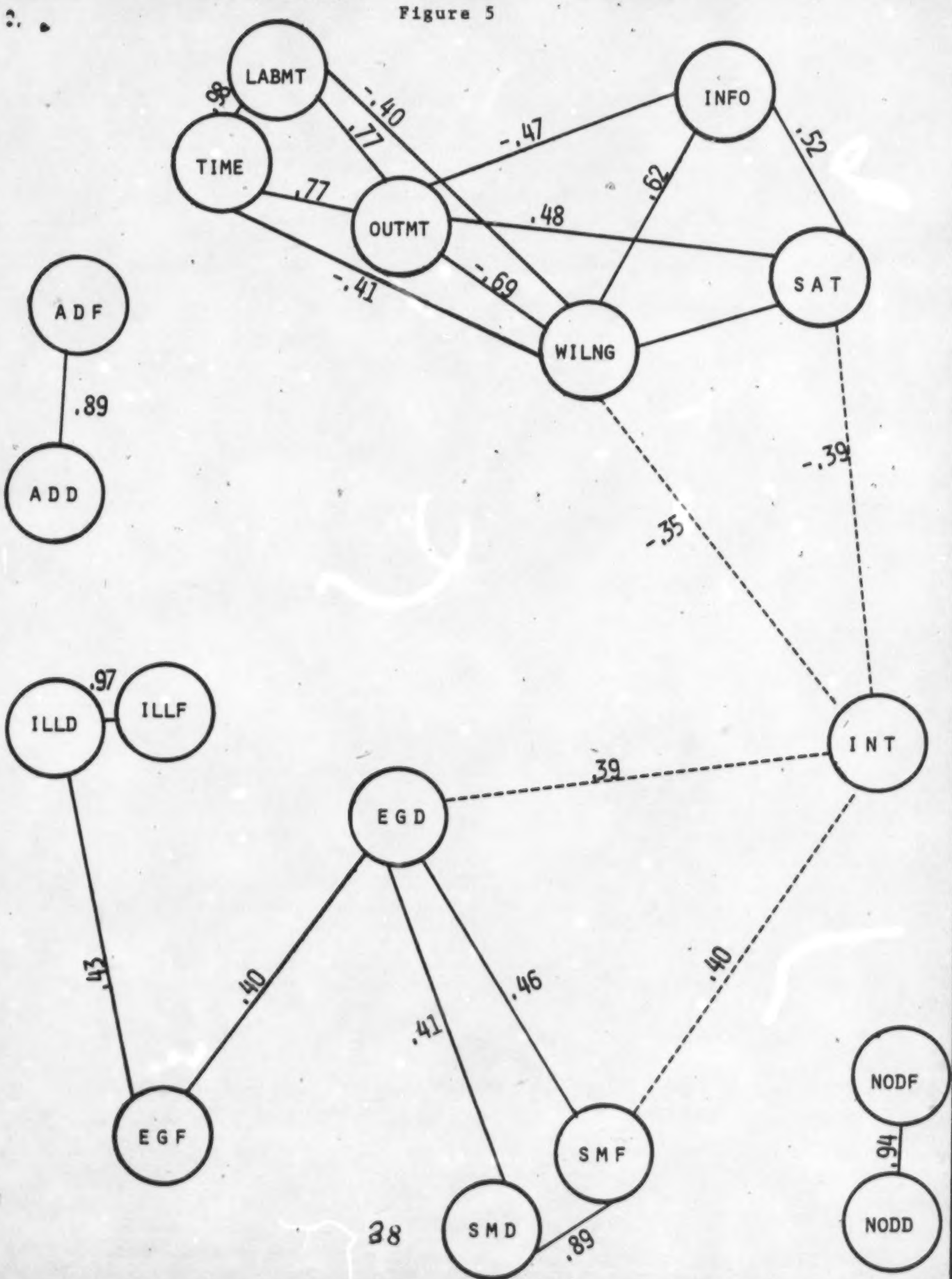


Figure 5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INFO
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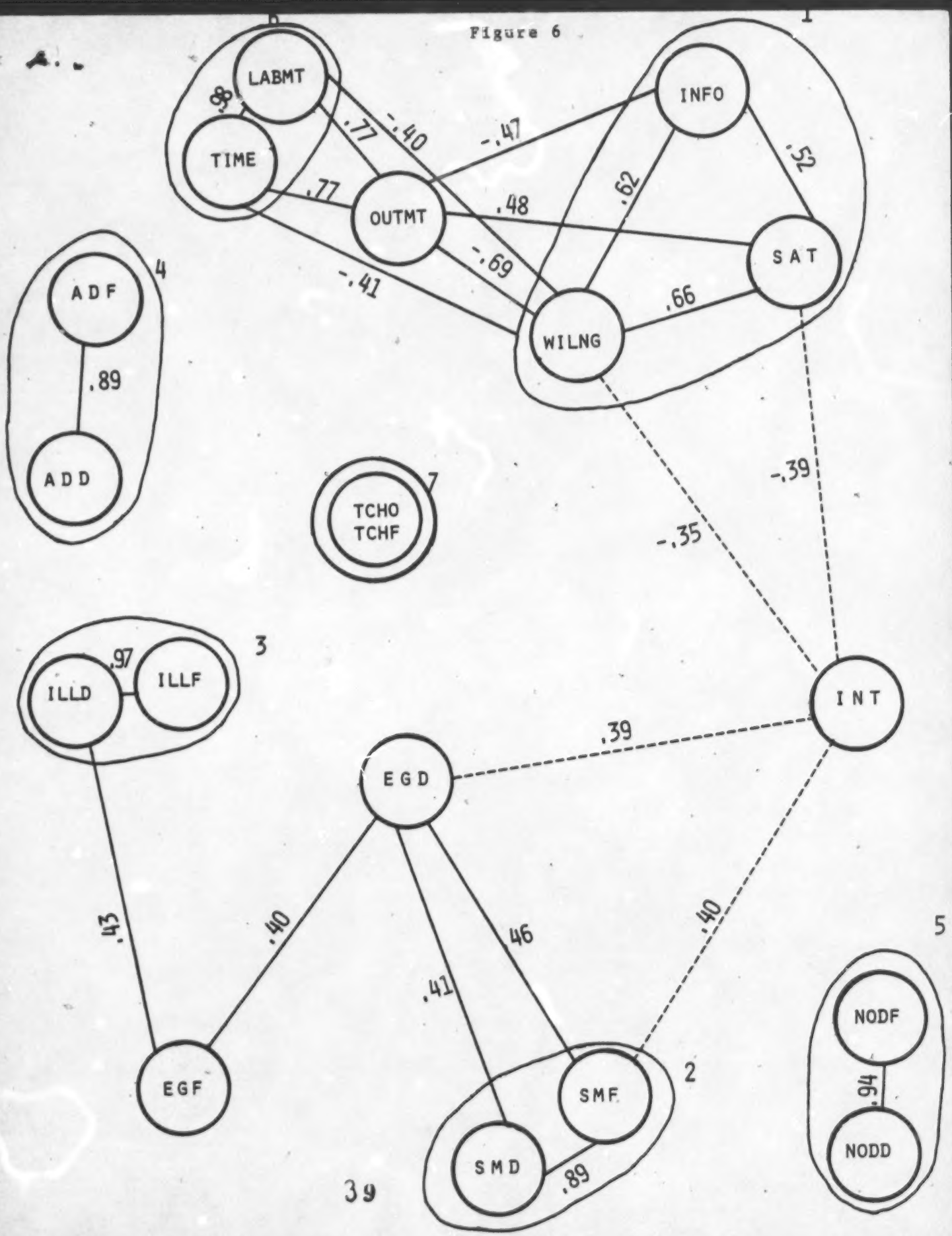
Figure 6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